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THE
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☞See advertisement on last page.

Poetry.

ALONE.

Twas midnight and he sat alone—
The husband of the dead,
That day the dark dust had been thrown
Upon her buried head.
Her orphaned children round him slept,
But in their sleep would moan;
Then fell the first tear he had wept—
He felt he was alone.

The world was full of life and light,
But, ah! no more for him!
His little world once warm and bright—
It now was cold and dim,
Where was her sweet and smiling face?
Where was her cordial tone?
He gazed around his dwelling place,
And felt he was alone.

He looked into his cold, wild heart,
All sad and unresigned,
He asked how he had done his part
To one so true, so kind?
Each error past he tried to track—
O could he but atone!
Would give his life to bring her back—
In vain—he was alone.

He slept at last: but when he dreamed
(Perchance her spirit woke,)
A soft light o'er his pillow gleamed,
A voice in music spoke—
"Forgot—forgiven all neglect—
Thy love recalled alone;
The Babes I leave; oh, love, protect!
I still am all thine own."

THERE IS GOOD IN THE WORLD.

There is good in the world,
Though sin may defile it;
There is joy 'mid our tears,
Though man may revile it,
Though crime's mighty banner
Is in darkness unfurled,
Yet remember this truth—
There is good in the world!

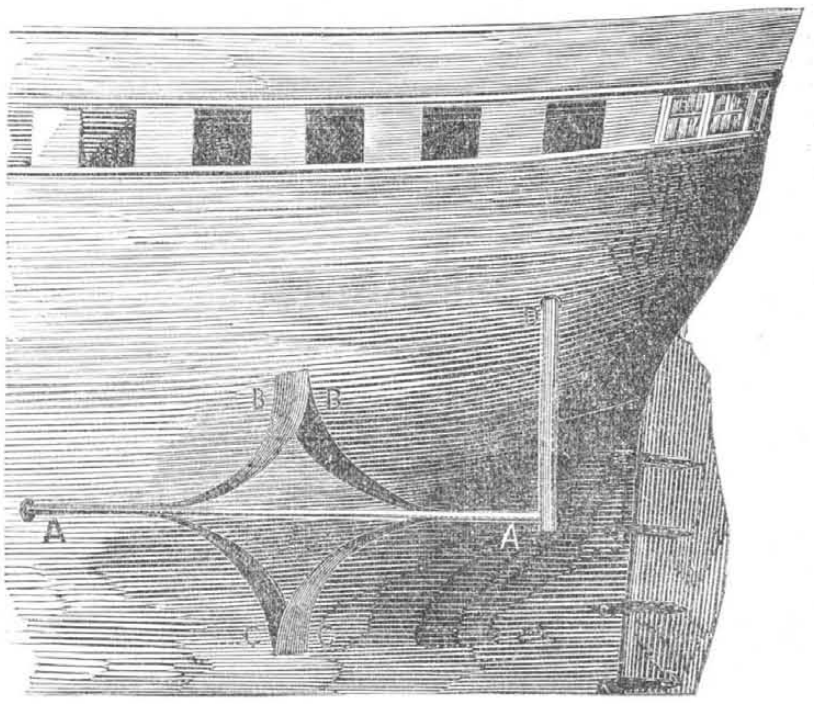
In the worst of our kind
There's a remnant of good,
It we knew but the cord,
Or the sensitive mood,
By which their kind feelings
Might again be unfurled,
Then their actions would prove
There was good in the world!

It is Love:—That's the key
That shall open the mind;
And 'tis kindness alone
Those strong cords can unbind.
Let each to his neighbour
Those pure feelings herald,
Then this truth shall increase—
That there's good in the world.

Riches and Poverty.

Riches and poverty depend on our desires rather than our pocket books. He that gets ten thousand a year, and spends fifteen, is considered rich, and yet he is not half so much so as the man who works for a dollar a day and spends six shillings.

PATCH'S PROPELLER.



This is is a new propeller invented by Mr. John Patch, a very ingenious mechanic of Boston, which he calls the "Double Action Propeller," and which was tried on a small boat in Boston, with only one propeller of three fans made of thin metal and a chronometer spring for a motive power, and was very successful—some good practical men expressing themselves highly pleased with its action and simplicity. Its novelty consists in applying the propeller on a horizontal shaft, one propeller on each side as represented in the engraving.

A A, is the shaft connected with the driving power and made to work in a proper suspension bearing D. B B and C C, are angular fans made of metal and joined together at the parts where they meet on the shaft, being bolted to the same. Each fan is bent in an elliptical form, and when two fans meet their relative position to the shaft is at an angle of about 30 degrees. Owing to this shape of the fans and their position to the shaft, they act upon the water when the shaft is turned to propel a vessel as has been proven, with a great propelling tendency.

Every person will at once see by the above engraving, that it is different from other propellers that have been used and that it is exceedingly simple. It is intended to act as a fin is used by some of the monsters of the deep, in propelling a vessel on the sculling principle, and combining something of the screw at the same time. Each fan has thus an independent propelling action in the water and it is so formed as to cut the water which resists the motion of the vessel—therefore its action in the water is very smooth, and it merits the attention of naval men.

The two fans as united at the top, keep one another from springing and from its simplicity it is not apt to get out of order.

The inventor would like if some of our enterprising ship owners would try one on a large scale and he would be perfectly willing to superintend its erection, at a fair mechanic's wages—a very small consideration indeed. This is a propeller which we would like to see tried. Those who have seen it operate, consider it very much superior to Erricson's, and while a dolphin can distance a steamboat, we must not consider ourselves at the *ultima* of steam boat speed. Measures have been taken to secure a patent.

Letters relative to the invention may be directed to Mr. B. B. Redding, Boston, Mass., from whom any further particulars may be obtained.

Hints to Wives.

If your husband occasionally looks a little troubled when he comes home, do not say to him, with an alarmed countenance, "What ails you, my dear?" Don't bother him; he will tell you of his own accord, if need be. Don't rattle a hail storm of fun about his ears neither—be observent, and quiet. Don't suppose whenever he is silent and thoughtful that you are of course the cause. Let him alone until he is inclined to talk; take up your needlework (pleasantly, cheerfully, not pouting, nor sullenly), and wait until he is inclined to be sociable. Don't let him ever find a shirt button missing. A shirt-button being off a collar or wristband has frequently produced the first hurricane in married life. Men's shirt collars never fit exactly—see that your husband's are made as well as possible, and then, if he does fret a little about them, never mind it: men have a prescriptive right to fret about shirt collars.

Flannel.

Flannel is becoming so popular for under dresses in southern as well northern climates, that the production of it is increasing very rapidly. Good substantial flannel, yard wide, can be bought now at retail for about 25 cents a yard. It is cheaper at this price, than goods made of cotton or flax, as it will wear twice as long as either. The English physicians have recommended the constant use of flannel for under dresses, as one of the best preservatives of uniform good health, and they urge its use particularly at this time, on the approach of the cholera.

These are facts which our farmers are deeply interested in, as bearing directly upon one of their most delightful occupations, that of sheep raising. Our boundless prairies in the north-west, the rolling lands of Ohio and Tennessee, and the secluded districts of New York, Pennsylvania and Virginia, offer boundless facilities for the raising of sheep, and every pound of wool is sure of ready sale at lucrative prices to the farmers.

Some are attributing the potatoe rot to guano, and we heard little or nothing of the disease before that manure was used; but we likewise seldom heard of it before the railways came into fashion.

RAIL ROAD NEWS.

New York and Boston Railroad.

This Company have determined to place under contract that portion of the line between the cities of New-Haven and Middletown, as soon as the amount of subscriptions obtained will justify them in so doing. The cost of this portion will not vary much from $550,000, or $22,000 per mile. Of this amount there has already been obtained on the line of Road the sum of $200,000; and $250,000 more (making $450,000 in all) is preferred by gentlemen interested in the portion of the Road from New-York to New-Haven. There remains therefore the sum of $100,000 to be supplied, and for this amount the Company have no resource but the City of New-Haven.

Baltimore and Ohio Railways.

The engineers of the Baltimore and Ohio Railway Company have decided, says the Cumberland Civilian, on the Knobby route on the Virginia side of the Potomac) west of that town. Two other routes had been surveyed—the lower one, crossing Will's Creek near its mouth, and the upper one leaving the Mount Savage road and crossing Will's Creek near the tan-yard. The Knobby route is preferred though the most expensive in first cost by $320,000, as the shortest, of least curvature, cheapest to maintain, least expensive for transportation, and therefore cheapest in the end.

Preventive Railway Collisions.

In consequence of the frequent collisions of railway trains on curves, a signal has been invented in England which promises good results. It is worked by a crank, which moves a wire on poles, like the electric telegraph, and operates at a distance of three quarters of a mile. If a train approaches, the lookout turns the crank, and a signal is made at the distance mentioned, and there is time to stop before any danger occurs.

Railway Accidents.

The number of passengers, says the London Railway Chronicle, according to the return recently published, who have travelled by railway during the half-year ending on the 30th of June last, amounted to 26,330,492,—which is just about the population of England Scotland and Ireland,—and some idea may be formed of the tide of human beings who have passed over the country, as Mr. Locke says, "by means of two parallel pieces of iron," when we reflect that the official numbers actually represent the transmission of every man, woman and child in the United Kingdom a certain distance, within the short period of six months, at a speed previously unattainable, and reduction of danger, considering the mass of human beings thus transferred, almost infinitessimal. Archimedes is recorded to have said, if he had standing ground he could move the globe, and though our modern engineers have not exactly attempted to work out that problem, they have satisfactorily solved another, which a few short years since would almost have been thought as visionary. The number of accidents figure 189; 90 resulted in death, and 99 in injuries more or less severe. Of passengers, 6 unfortunately were killed and 60 hurt from no fault of their own, a wonderfully small proportion when we consider the enormous aggregate who now use this mode of locomotion; the remainder of the casualties is made up from accidents to railway servants, laborers on the lines in construction, and persons who have taken this novel mode of committing suicide, by precipitating themselves from trains or into their way, but who, in fact, have as much to do with the safety of railway travelling as a man blowing out his brains has to do with the safety of fire arms.

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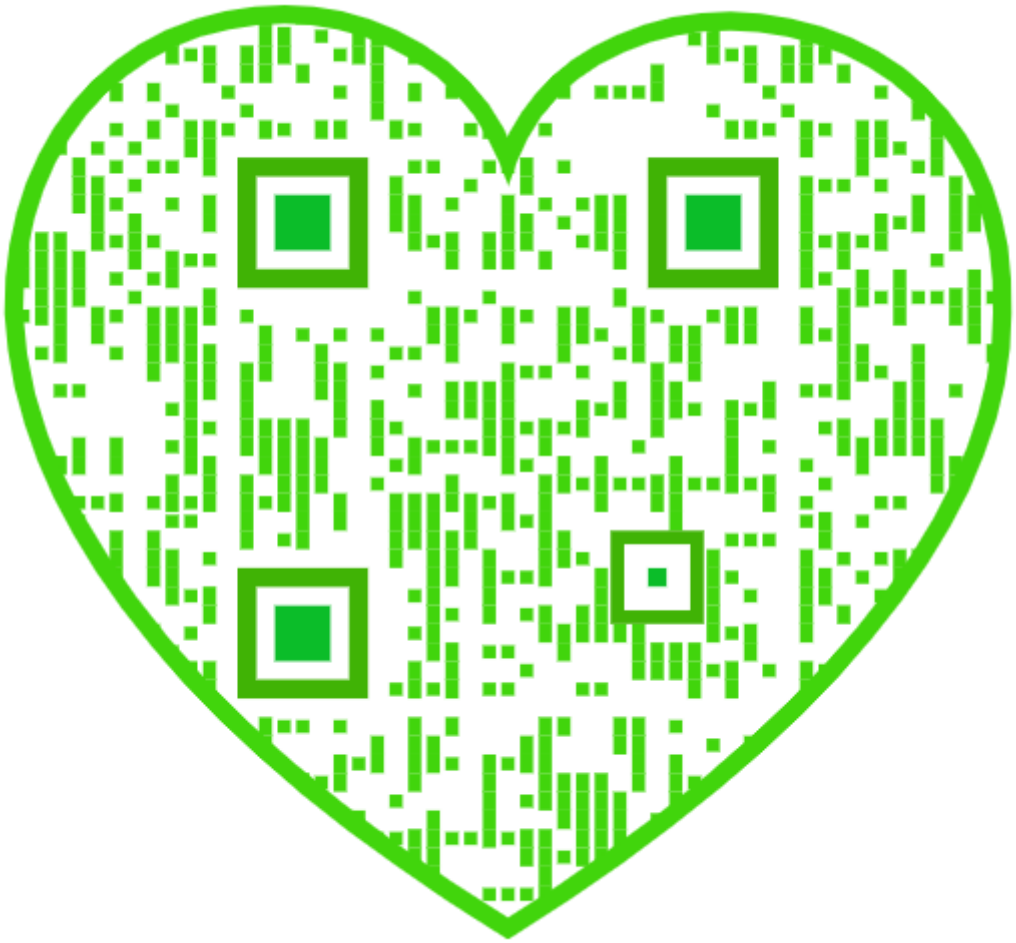

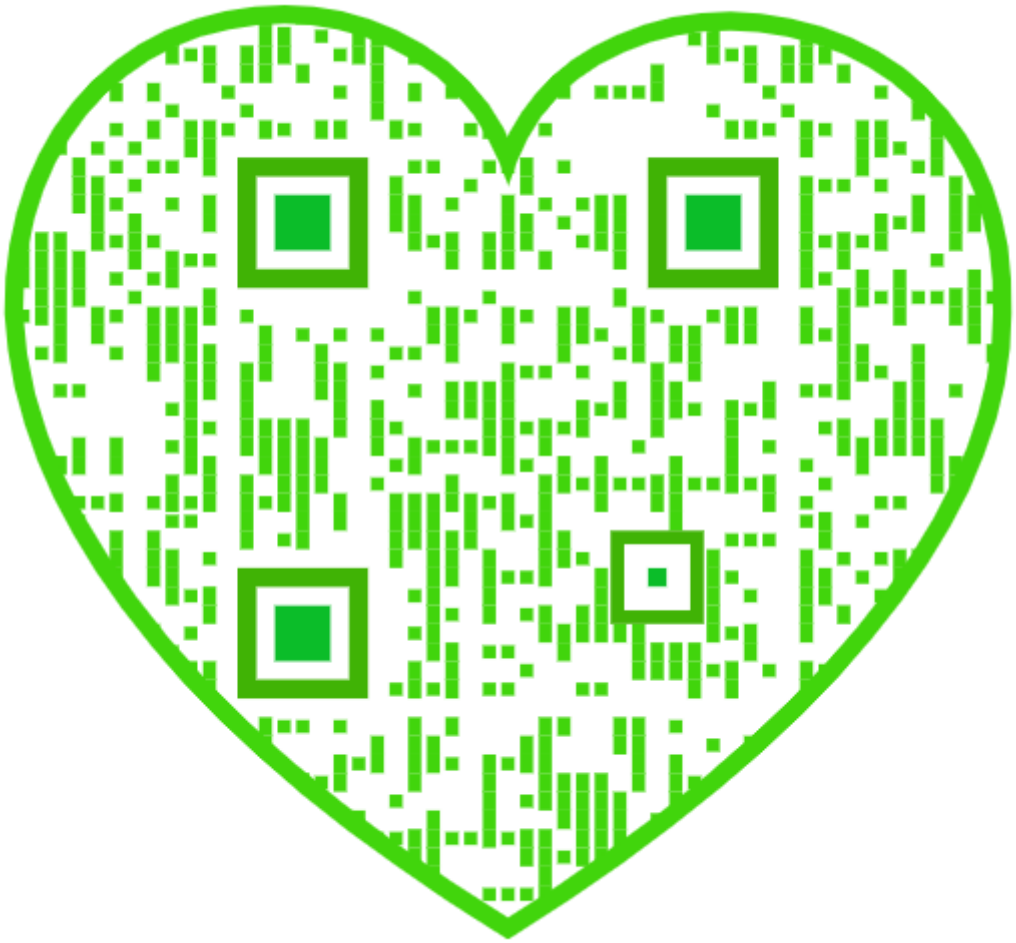

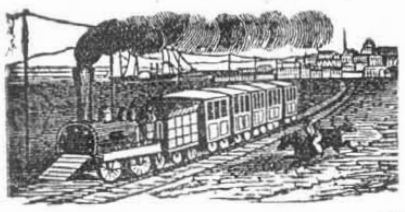

The Fair of the American Institute.

No. 2.

GOLD PENS.

We perceive that gold pens flourish this year in a conspicuous manner, among which Bagley's retains a high position, but we perceive a new improvement introduced to the Fair this year by Mr. Barnard A. Warren of York st. Brooklyn. The pen is set in the holder in a peculiar way, and inside is fixed a silver pallet, which, pressing upon the lower side of the nib, but raising from the body of the pen itself, serves to hold a supply of ink with one dip to write rapidly a half a page of MSS,—while only a given quantity is allowed to flow from the point at each pressure of the hand. Thus any danger of blotting, with the swiftest writing, is entirely obviated, and a great improvement effected, which will be fully and particularly appreciated by all whose occupations force them into a rapid chirography. A cut of this pen is to be found in Vol. 3 Scientific American.

TELEGRAPH.

House's electric printing telegraph occupied much attention. It is an ingenious instrument and is played like a piano. The managers were communicating by it with Philadelphia. As we intend to describe this instrument more fully in our treatise on the telegraph, we will say no more about it at present.

NORTH'S SPHERICAL MILL.

This mill of Mr. North, of Jersey City, and but recently patented, is certainly a new and useful improvement in grinding mills. It was highly approved by all those who saw it and understood its principle. The nature of its invention consists in giving a cup with a large ball below rotary motions, the motion of the one being contrary to the other—the very best method of grinding such substances as indigo, &c. From one of these mills being in operation at Messrs. Sibree & Co.'s, Bergen Hill, its practical results (the only true test of merit) are good—no substance can resist its grinding powers. In the old mills the balls only have motion.

ROTARY ENGINE.

Gen. Howard exhibited his steam wheel last week, and J. H. Von Schmidt his rotary pump This pump is very excellent and will throw a good stream of water according to the power applied.

DOG POWERS.

A Dog Power machine was exhibited by Messrs. Crane, of N. J. It is simply a rotary foot horse power, using the moveable circle as a traction power to drive friction wheels that propel a shaft. This is a much better way to employ dogs than to keep them for yelping. Any farmer might construct a power of this kind, and it is very useful for churning, washing potatoes, shelling corn, &c.

HARNESS MACHINE.

A machine for making weaver's heddles the property of Messrs. Vogel and Thomas of Saccarappa, in Maine, is the most curious and ingenious machine at the Fair or that has been exhibited for many years. It makes beautiful heddles—and one girl can make 18,000 per day. Next week we shall publish a full illustrated description, of this wonderful machine as we believe that it is of great moment to our manufacturers. More information can be obtained about it at present at this office.

AGRICULTURAL IMPROVEMENTS.

The Avenue to the Hall is crowded this year as usual with corn shellers, straw cutters ploughs, &c. We noticed especially the premium Straw Cutter of Mr. Byron Densmore, Brockport, Monroe Co. N. Y. This straw cutter was only patented last June, and it uses the best of all ways to cut, namely, the dip and lift motion. It has already taken six premiums and although it is made of the best materials it costs only $15. Farmers should have good tools, and here is a cutter that cannot fail to give satisfaction. The Agricultural improvements are of an unusual excellence and variety.

A number of very beautiful Omnibuses and Hose Carts attract universal attention.

WASHING MACHINE.

Washing machines are not quite so numerous this as last year, and therefore not so much variety. The Ladies Delight we perceive is still favorably exhibited, but Ira Avery's vertical rotary, along with his wringer, should be in every family—the wringer especially.

A very good Clothes Drier—a series of circular lines revolving on a vertical shaft is also exhibited. This is not new, but very useful.

GAS APPARATUS.

Mr. Crutchet exhibits what is called his "solar gas light," it is a portable retort, and a good invention and has been highly recommended. It is our opinion, that with a small portable gas retort, all our farmers who burn hard wood, might save their gas light out of it, by having a small purifier and receiver. They might thus save their tallow which is always a cash article.

Mr. A. Maish, exhibits his improved gas meter, and it has been justly admired.

PORTABLE FORGE AND BELLOWS.

Messrs. Taylor and Flagler of No. 211 Water st. N. Y., exhibit Mac Queen's Portable Forge and Bellows, which is a good apparatus. A patent was lately secured for a valuable improvement on this forge. E. & S. D. Gould of Newark N. J. exhibit a really good portable Morticing Machine.

WINDLASSES.

A number of windlasses are exhibited, but we saw none that was superior in our opinion to Mr. C. Leavit's of Rockville, Ct. The principle of this windlass, is the application of the toggle joint in combination with the lever.

COOKING STOVES.

A great variety of these are exhibited and it is morally impossible to give an opinion regarding their comparative merits. We observe however one defect in every stove, viz. the difficulty in cleaning out the furnace of ashes and cinders—there is not a single stove but might have a sliding perforated bottom in combination with the ribs, whereby it could be easily cleaned out, but we suppose that more fingers must suffer before our recommendation will be attended to—circular stoves have swinging bottoms, to be sure, but they have the defect of being difficult to kindle.

A PILL MACHINE.

A Pill machine is exhibited—a wonderful little catch, roll and snap apparatus. It can grind out pills by the hundred and as a gentleman observed, it was just the thing for our people. The dough for the pills is fed into a hopper and it is then cut out into pill form by a small revolving wheel with its periphery full of moulds which drops them as it revolves and they are then rubbed and doused over with pill dust and fitted for the *bolting* operation. A couple of grooved rollers to feed in the dough, cutting it off at pill distances would form the pill faster, but taking this machine for all in all, it is a unique.

MANUFACTURES.

We observe some beautiful samples of Cotton Cord made at Mr. Noyes' factory, in William st. this city. This article, is a splendid imitation of the imported Linen Cord, and might fairly be mistaken for it. It has all the appearance and nearly the strength; certainly no cotton cord ever manufactured before in this country, or any other, can compare with it.

A NEW LIFE PRESERVER.

We witnessed many curious scenes in the city during this week and last, and among the rest we were particularly struck with the properties of a new life preserver invented by Messrs Ralston and Phillips, the former of Washington Co. and the latter of Pittsburg Pa. It consists of an improved dress of india rubber cloth, part of which is inflated and in which the swimmer is encased. We saw Mr. Ralston enjoy a rough and tumble in the East River and he came out, threw off his preserver and (having all clothes on) not a thread was wet. A young man of the name of Lowell, crossed from Williamsburg to this city in it—a distance of about three miles with steamboats passing him every few minutes, and when he arrived at Peck Slip, he came out of his shell dry, ready for parade. It is a most excellent invention and Mr. Ralston informs us that he has applied for a patent.

A person wearing one of these life preservers can carry from fifty to one hundred lbs., in addition to their person, and float four persons in the water, without sinking, and can take no other position on the water, except with the head and shoulders entirely above the water.

The entire person save the face, is enclosed, enabling the wearer to float in an erect, or sleep in a reclining posture, or with paddles which are attached, propel himself at the rate of three miles per hour. His person is kept entirely dry, and the heat of his body is so retained, that he is warm and comfortable, when floating on water in cold weather.

IRON PLANING MACHINES.

A number of these are exhibited, but that of Mr. Hartson No. 42 Gold st. this city, and a cut of which is to be found page 297 Vol. 3, Scientific American is the best that we have seen, both as it regards solidity, correctness and beauty of workmanship. Mr. Hartson has a good sale for his machines because his workmanship—the very essence of good tools—is of the first stamp.

His Drill at the Fair has been highly praised by good practical mechanics, who are the best judges. Those who desire good Lathes, Iron Planing Machines and Drills, will not be disappointed in purchasing of Mr. Hartson.

ANOTHER FIRE AND WATER PROOF PAINT.

Among many substances which have been brought forward for this purpose, we can specially testify that (No. 2015) a paint made from *transition argilite*, and discovered by James M. Albright of Schenectady, N. Y. is a most excellent and unequalled substance. We have exposed it to heat, air, &c. and it becomes harder and better. It can mix with many paints and is not very dark, and it can be employed for all kinds of painting, it being capable of taking a very fine polish. All wood painted with this, is made Fire Proof and we cannot but consider it to be a most important discovery, for it is cheap and is to be found not confined to one place but scattered throughout our broad land.

M. Leverrier's Planet.

We extract the following from the account given by the National of the last sitting of the Paris Academy of Sciences, on the 29th ult. :—"That planet,—how shall we express ourselves ?—that wonderful planet discovered in the height of the skies, without the use of the telescope by the direct sight of the mind—that planet, the discovery of which caused a sensation in the world, dissension between two rival nations, had been an incentive to the imagination of poets, the liberality of chancellors, the passionate curiosity of women and even of children. Well, that planet does not exist. What ! will you say there is not in the skies a planet called Neptune ? That that astra was not seen on the 23d of September 1846, near the star Delta of the Capricorn, by a German named Galle, who was decorated for having made the discovery ? Since that epoch the new planet has not been again seen by astronomers, who have observed its revolution and measured all its movements ? Have astronomers then told a falsehood ? No : Neptune exists, but it is not the planet announced by M. Leverrier." The truth of this assertion was admitted by M. Leverrier himself.

Opposition of Improvements.

On the western coast of England, it has been the custom from time immemorial for a number of old women to act in the capacity of bathing the young ladies of the aristocracy. But recently these old bathing women have been greatly scandalized by the intrusion of a new machine which is quite an innovation in its way. It has a moveable screen, behind which damsels can be ducked in secret. They regard the whole as a sign of degeneracy and mock modesty. And these ideas are more sensible than some others we have heard advanced against innovations.

The Manchester Examiner mentions an argument advanced by a Bolton man to prove that the moon was not inhabited—no Scotchman had been known to visit it.

New use for Castor Oil.

The Alton Telegraph says: "We were presented by Mr. E. Morse of this city, with one of his candles manufactured from castor oil, and were induced to test its qualities with a sperm candle. The experiment resulted in the demonstration that the castor oil lasted longer than the sperm candle, and the light of the former was decidedly more brilliant and extensive than that of the latter. We could not discover the least unpleasant smell from burning the castor oil candle, and believe that they are well calculated to supersede entirely the use of the sperm candle. Mr. M. informs us, they could be afforded by the quantity at twenty-five cents per pound—about one-half the cost of the sperm candles."

Will not some of our farmers try olive culture ? It grows well in Greece and Spain, and we certainly have the same climate as those countries, in some of our States. No oil combines so well with barilla to form good soap, as the olive. It is good for domestic use as food, and it also burns well. It is a source of great profit to Turkey, as they supply Great Britain for the making of her fine soaps and the dyeing of her Adrianople Red.

Vancouver's Island and the Hudson's Bay Company.

In the House of Lords, on 20th ult. Lord Mounteagle, in moving for papers relative to the cession of Vancouver's Island to the Hudson's Bay Company, took the opportunity to urge the impolicy of that transaction. Earl Gray defended the grant, on the ground that it was the most effectual mode of preventing "squatting" from America, which in a short time would place the practical possession of the Island in the hands of the United States. He asserted that the Hudson's Bay Company were better prepared to colonize the Island than other parties, and that the most ample security had been taken for the proper government of the colony, and its resumption by the crown at the end of eleven years, on equitable terms if deemed necessary.

An aristocratic government gave the Island to the Hudson Bay Company. Well, we hope that the Company will be more generous to emigrants than the government, but we must say it was wretched policy—as has been proven by every *patent grant* in the United States and the Canadas

The Artesian Well at New Haven.

This artesian well it seems is no great shakes of a job after all, as it respects the labor to sink the tubes, for not a single strip of rock had to be drilled for the purpose and only 40 feet of tube was necessary. But one good thing was accomplished viz. the finding of water, not very pure we believe, such a short distance below the surface, to rise to the top of the tube. The pipe was forced down by strong pressure, through about 36 feet of blue mud into a bed of sand, which was penetrated to the further distance of about four feet, when a bed of gravel was reached, when water rose at the top of the pipe sufficient for all the supply that can be desired.

In 1825 there was opened in Cochin China a canal, twenty-three miles long, eighty feet wide, and twelve feet deep. It was begun and finished in six weeks, although carried through large forests and over extensive marshes. 20,000 men worked upon it day and night, and it is stated that 7000 died of fatigue.

Soap Stone Griddles for cooking buckwheat cakes have been introduced. They are represented as capital, baking the cake finely and without the use of grease.

Mr. J. Orr and a number of artists from this city have gone to the sources of the Hudson, to take sketches for Townsend & Orr's Panorama of the Hudson River.

Volcanic coal is found in abundance in the Sandwich Islands, and burns better than mineral pitch.

The government has hired sixteen of the spacious stores on the Atlantic Dock, Brooklyn, for a period of 15 years, at the rate of $60,000 per annum.

Potatoes around this city are fast decaying with the rot.

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The Electric Telegraph.

No. 1.

The controversy and litigation going on at present in our country respecting Telegraphs, is misunderstood by many, because those who have endeavored to set the matter in a *clear* light before the public, have themselves not been sufficiently acquainted with the subject. The dispute does not relate to electricity for conveying messages almost instantaneously to distant places. Electricity was used for telegraphing by Lomond in 1787. He used only the electrical machine and this has been used as a set off to Prof. Morse, but the two telegraphs are very different, as we shall explain in another place. The common electrical machine never could be employed economically for telegraphing, hence until the discovery of Galvanism, we consider all previous attempts at telegraphing as but so many abortive experiments.

Galvanism and Electricity, in some respects are alike, and in others they are not.—Galvanism is continuous in its supply—electricity is not. Galvanism can produce an electro magnet—electricity cannot, and while the former is continuous in its supply, the latter is irregular. The sources of supply, however, may make all this difference, but Prof. Farrady of London, and Professor Donovan of Dublin, have totally different views regarding the nature of both, and with these learned men we will leave this controversy, only stating that electricity cannot operate the electro magnetic telegraph.

Electro Magnetism is different from Galvanism. It is the combination of the galvanic current with a magnet, and the claim set up by Professor Morse, is the use of Electro Magnetism for telegraphic purposes. So says the defenders of Professor Morse—a broad ground—and a claim denied by Professor Morse himself. At any rate—let us make the distinction here, that "a telegraph operated without the magnet, cannot, in the widest sense of the term, be an infringement of a patent for electro magnetism"

Professor Oersted, of Copenhagen, Denmark, was the first who developed the power of lightning in destroying and reversing the polarity of the magnet. This was in 1819.—The first observation of Oersted was that "an electrical current such as is supposed to pass from the positive to the negative pole of a voltaic battery, along a wire which connects them, causes a magnetic needle placed near it to deviate from its natural position." No sooner was this announced to the world than Sir Humphrey Davy discovered that a steel needle, not possessing magnetic properties, became so by placing it in the electric current. This was the first electro magnet, and M Ampere, of Paris, and Davy made the same discovery at the same time although widely separated from one another, and what is very singular, the needle can be made a permanent or transitory magnet just by placing it in different positions with the wire of the battery. M. Ampere thus explans electro magnetism and the way to construct an electro magnet. "The wire is formed into a hollow screw, or helix, by rolling it round a solid rod wrapping the needle in paper, placing it in the centre of the helix and establishing a communication with the galvanic battery, which conveys the electric current by the spiral convolutions round and round the needle and communicates to it the electric circulation constituting magnetism."

The explanation of the *magnet* and *electro magnet*, as given pages 14 and 15 of Mr. Vail's work, conflicts with the account in the Encyclopedia Americana, page 463, but that does not affect the principle. Electro Magnetism nor the electro magnet was not the discovery of any telegraphic patentee as we have shown, Oersted, Davy and Ampere alone could have secured patents for the discovery, and last, but not least, our own Professor Henry, who undoubtedly made the same discovery independent, about that period. Davy was a man who always gave his discoveries to the public—hence electro magnetism has been common property for 47 years. The principle of conveying intelligence to a distance by an electric current and conducting wires, was known and practised by Reizen in 1794, therefore that was nothing new to the illustrious philosophers whose names we have mentioned. Electro Magnetism then, as a philosophical principle, cannot justly be claimed now by any individual, for any purpose whatever.

A new and improved way of applying electro magnetism to produce certain results, can be patented by the laws of civilized nations, but the means used is the subject—not the principle employed. It is right that a clear understanding should be had of this subject.

(*To be continued.*)

Ivory.

Ivory is the osseous matter of the tusks and teeth of the elephant, the hippopotamus, or morse, &c. The hardest, toughest, whitest, and clearest ivory, has the preference in the market; and the tusks of the sea-horse are considered to afford the best. In these, a rough glassy enamel covers the cortical part, of such hardness, as to strike sparks with steel. The horn of the Narwhal is sometimes ten feet long, and consists of an ivory of the finest description, as hard as that of the elephant, and susceptible of a better polish; but it is not in general so much esteemed as the latter.

Ivory is very apt to take a yellow-brown tint by exposure to air. It may be whitened or bleached, by rubbing it first with pounded pumice-stone and water, then placing it moist under a glass shade luted to the sole at the bottom, and exposing it to sunshine. The moist rubbing and exposure may be repeated several times.

For etching ivory, a ground made by the following receipt is to be applied to the polished surface:—Take of pure white wax, and transparent tears of mastic, each one ounce; asphalt, half an ounce. The mastic and asphalt having been separately reduced to fine powder, and the wax being melted in an earthware vessel over the fire, the mastic is to be first slowly strewed in and dissolved by stirring; and then the asphalt in like manner. This compound is to be poured out into lukewarm water, well kneaded, as it cools, by the hand, into rolls or balls about one inch in diameter. These should be kept wrapped round with taffety. If white rosin be substituted for the mastic, a cheaper composition will be obtained, which answers nearly as well; 2 oz. asphalt, 1 oz. rosin, ½ oz. white wax, being good proportions. Callot's etching ground for copper plates, is made by dissolving with heat 4 oz. of mastic in 4 oz. of very fine linseed oil; filtering the varnish through a rag, and bottling it for use.

Either of the two first grounds being applied to the ivory, the figure is to be traced through it in the usual way, a ledge of wax is to be applied, and the surface is to be then covered with strong sulphuric acid. The effect comes better out with the aid of a little heat; and by replacing the acid, as it becomes dilute by absorption of moisture, with concentrated oil of vitriol. Simple wax may be employed instead of the copperplate engraver's ground; and strong muriatic acid instead of sulphuric. If an acid solution of silver or gold be used for etching, the design will become purple or black, on exposure to sunshine. The wax may be washed away with oil of turpentine. Acid nitrate of silver affords the easiest means of tracing permanent black lines upon ivory.

Ivory may be dyed by using the following prescriptions:—

1. Black dye.—If the ivory be laid for several hours in a dilute solution of neutral nitrate of pure silver, with access of light, it will assume a black color, having a slightly green cast. A still finer and deeper black may be obtained by boiling the ivory for some time in a strained decoction of logwood, and then steeping it in a solution of red sulphate or red acetate of iron.

2. Blue dye.—When ivory is kept immersed for a longer or shorter time in a solution of indigo (partly saturated with potash), it assumes a blue tint of greater or less intensity.

3. Green dye.—This is given by dipping blue ivory for a little while in solution of nitro-muriate of tin, and then in a hot decoction of fustic.

4. Yellow dye is given by impregnating the ivory first with the above tin mordant, and then digesting it with heat in a stained decoction of fustic. The color passes into orange, if some Brazil wood has been mixed with the fustic. A very fine unchangeable yellow may be communicated to ivory by steeping it 18 or 24 hours in a strong solution of the neutral chromate of potash, and then plunging it for some time in a boiling hot solution of acetate of lead.

5. Red dye—may be given by imbuing the ivory first with the tin mordant, then plunging it in a bath of Brazil wood, cochineal or a mixture of the two. Lac-dye may be used with still more advantage, to produce a scarlet tint. If the scarlet ivory be plunged for a little in a solution of potash, it will become cherry red.

5. Violet dye—is given in the logwood bath to ivory previously mordanted for a short time with a solution of tin. When the bath becomes exhausted, it imparts a lilac hue. Violet ivory is changed to purple-red by steeping it a little while in water containing a few drops of nitro-muriatic acid.

With regard to dyeing ivory, it may in general be observed, that the colors penetrate better before the surface is polished than afterwards. Should any dark spots appear, they may be cleared up by rubbing them with chalk, after which the ivory should be dyed once more to produce a perfect uniformity of shade.

On taking it out of the boiling hot dye bath, it ought to be immediately plunged into cold water, to prevent the chance of fissures being caused by the heat.

If the borings and chips of the ivory-turner, called ivory dust, be boiled in water, a kind of fine size is obtained.

Formation of Hail.

Professor Stevelley, at a meeting of the British Association, read a paper on meteorological phenomena, in which he attempted to account for the formation of hail, by supposing that it must be formed when after the fall of some rain, a sudden and extensive vacuum being caused, the quantity of caloric abstracted was so large as to cause the rest of the drops to freeze into ice balls as they formed. This principle, he said, had been strangely overlooked, although, since the days of Sir John Leslie, every person was familar with experiments on a small scale illustrative of it. He also said that the interesting mine of Chemnitz, in Hungary, afforded an experimental exhibition of the formation of hail on a magnificent scale. In that mine the drainage of water is raised by an engine, in which common air is violently compressed in a large cast iron vessel. While the air is in a state of high compression, a workman desires a visiter to hold his hat before a cock which he turns; the compressed air, as it rushes out over the surface of the water within, brings out some with it which is frozen into ice bolts by the cold generated by the air as it expands; and these shoot through the hat to the no small annoyance of one party, but to the infinite amusement of the other.

The Benefit of the Swallow.

These mysterious visitants, creatures of instinct, are by many persons supposed to perform their eccentric gyrations from mere caprice, while, in reality, they are amongst the very best friends of mankind. We would as soon see a man shoot one of our fowls or ducks, or rather he would steal his hatful of eggs from the hen-roost, as shoot one of these beautiful annual visitants, or destroy one of their nests. If it were not for such beautiful and graceful birds, our crops would be totally annihilated by vermin. Take the plant-louse—Bonnet, whose researches on it remind us of Huber on the honey bee, isolated an individual of this species, and found that from the 1st to the 22d of June it produced ninety-five young insects, and that there were, in the summer, no less than nine generations.—These are both wingless and winged, and Bonnet calculates a single specimen may produce 550,080,489,000,000,000 in a single year, and Dr. Richardson very far beyond this! Now when we see the swallow flying high in the air, he is heard every now and then snapping his bill, and swallowing these and similar destroyers. Now if in summer a swallow destroys some 900 mothers per day on an average, and estimating each of these the parent of one tenth of the above number, it is beyond all appreciable powers of arithmetic to calculate.

How far the Provision of Food is due to the Labor of Man.

The number of human beings on the earth is calculated at nearly one thousand millions: all of these are fed from the produce of the ground; for even animal food is itself the produce of the ground. It is true that, for this result, man in general must labor; but how small an actual portion of this immense productiveness is due to man! His labor ploughs the ground, and drops the seed into the furrows. From that moment, a higher agency supersedes him. The ground is in possession of influences which he can no more guide, summon, or restrain, than he can govern the ocean. The mighty alembric of the atmosphere it at work: the rains are distilled, the gales sweep, the dews cling, the lightning darts its fertilizing fire into the soil, the frost purifies the fermenting vegetation,—perhaps a thousand other agents are in movement, which the secrets are still hidden from man; but the vividness of their force penetrates all things, and the extent of their action is only to be measured by the globe; while man stands by, and has only to see the naked and drenched soil clothing itself with the tender vegetation of spring, or the living gold of the harvest,—the whole loveliness and bounty of Nature delighting his eye, soliciting his hand, and filling his heart with joy.

The Lakes.

The entire line of lake coast is 5,000 miles of which 2,000 constitute the British coast. The following is the result of the survey of the U. S. Topographical Engineers:—

Lake Champlain 105 miles, greatest width 12, average width 8; Lake Ontario 180, greatest width 62, average width 30; Lake Erie 240, greatest width 57, average width 38; Lake St. Clair 18, greatest width 25, average width 12; Lake Huron 270, greatest width, (not including the extensive bay of Georgian, itself 120 miles long, and averaging 45 miles in width,) 105, average width 70; Lake Michigan 340, greatest width 83, average width 58; Lake Superior 420, greatest width 135, average width 100.

These lakes may be considered as connected throughout their whole extent. Lake Champlain connects with Lake Ontario by means of the river Richelieu, the lock and dam navigation of St. Lawrence river, the Ottowa river, the Rideau Canal through Canada, and the Champlain and Erie Canals of New York. Lake Ontario is connected with Lake Erie by means of the Welland Canal through Canada, and by means of the Oswego and Erie Canals through this State. Lake Erie is connected with Lake St. Clair by the deep navigable strait of Detroit, 25 miles long. Lake St. Clair is connected with Lake Huron by the navigable strait of St. Clair, 32 miles long. Lake Huron is connected with Lake Michigan by the deep and wide strait of Mackinaw, and with Lake Superior by the strait of St. Mary's 46 miles long.

Honesty and Restitution in a Cod Fish.

A sloop was recently lying in Lockbroom, Scotland, the skipper of which when fishing over the side lost the keys of his lockers, &c., from his pocket into ten fathoms of water.—Attached to the bunch was a small piece of parchment on which his name and that of the vessel were written. He, of course, gave up all hopes of the keys again, and gazed on their rapid descent into the watery depository with deep regret. Six weeks afterwards, the skipper cast anchor off the Island of Rassay, about one hundred miles from Lockbroom, and again resumed his piscatory employment. Among the results of his labors was a large cod-fish, which was speedily unhooked and thrown upon the deck; and, to the utter amazement of the skipper, the poor cod, when in the last agonies of death, vomited up his bunch of keys. The parchment being partly preserved proved his property beyond a doubt. At the same time, as if conscience stricken, it disgorged a penknife belonging to a brother skipper, on which his initials were engraved. It is a remarkable circumstance that this fish in its migratory course should arrive at the same spot where the sloop was, sacrificing his life and with its last breath discharging an act of honesty that would have honoured a higher grade or species of animal.—[*Very* "remarkable!"]

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New Inventions.

Improvement in Railroad Switches.

Mr. Freeborne, of Boston, says, the Rainbow, has invented a contrivance for preventing locomotives from running off the track from any negligence of switching, and also for dispensing with a "switchman" altogether. The invention is attached to the locomotives and cars, and the switch is thereby opened and closed by the engineer or brakeman, and a train of cars cannot in any event go off the track unless some obstruction is thrown upon it. This will be an invaluable discovery both in point of safety and economy, as it will enable roads to dispense with a large number of men, and insure greater safety than the old plan of switching.

Improved Locomotives.

The Pennsylvanian says that "an engine is now constructing at Wilmington, for the Philadelphia, Wilmington, and Baltimore railroad which will attain the greatest amount of speed yet reached by any locomotive in this country.

The great obstacle to the increase of speed heretofore has been in the oscillatory motion of the motive car, which a given amount of increased steam-power renders so great that not only is the speed impeded greatly, but both the engine and the track become much racked and shattered by it.

The experienced and skillful superintendent of the engine factory of the Philadelphia, Wilmington, and Baltimore railroad, Wm. L. Treeger, has devoted his attention to this subject, and from his success in the application of his improvement on a smaller scale will secure in the mammoth locomotive now building a very great amount of speed.

It is an improvement of great importance, not only as it increases the speed and safety of railroad travelling, but as it saves any increased wear and and tear of the road and the engine.

The main principle of the improvement is the application of braces, which resist the oscillatory motion and impart to the engine such firmness that the application of all the steam power results exclusively in an onward motion, and does not produce the double and antagonist motions of sideways and onwards both."

The Pensylvanian is surely aware that 60 miles an hour has been run without sensible oscillation to found a theory for the limitation of an engine's speed by oscillation.

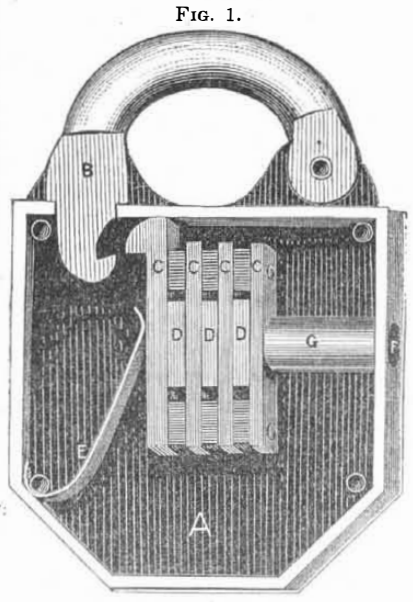
Thermometer and Gravitating Clock.

By the True Democrat of Joliet, Ill. we learn that Mr. Jearum Atkins of that place has constructed a clock which has been running for the term of two months, and gives every proof, that it will continue to run by the same power without winding up until it is worn out. This machine has been examined by several learned men who have expressed their belief, that it will continue to perform as it has done, all the requisites of perpetual motion, (not allowing for the decay of the material of which it is constructed,) as long as the laws of nature remain unchanged. The power by which this machine is propelled is obtained by the combined agencies of natural heat of the sun, and the attraction of gravitation. The power of heat, being absorbed by a rod of metal, causes said rod to expand, which on cooling contracts, and this expansion and contraction of said rod of metal, which takes place alternately, as often as it undergoes these changes of temperature, is by means of levers made to raise a weight,—which weight is suspended upon an endless chain passing over pullies, in such a manner as by its gravitating force, to exert a perfectly uniform power upon the machinery of the time piece, whereby perfectly uniform and continued motion is produced.

COLTON'S PATENT LOCK.

This is a new simple, and anti-pickable lock invented and patented by Mr. Sabin Colton, of the city of Philadelphia One great fault belonging to most all combination locks is their complexity. No such objection can be raised to this and we are therefore happy to introduce it to public notice. The principle of this lock consists in having three circular metal discs—having one quarter of the circle plane faced, placed in a metal frame with grooves cut in it to allow the discs, or as we will call them "buttons," to turn firmly and also independently on the same axis. On this frame is the catch which holds or relieves the bolt or bow of the lock, which by means of a spring throws out the catch or detent when the discs or buttons are in a certain position, managed by the key in the frame.

Fig. 1.



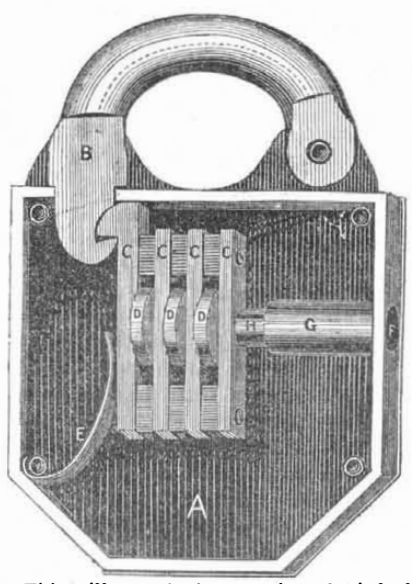
This is a view of the lock with grooved plate off, and exhibits the apparatus unlocked by the buttons showing their planes out of the groove plate. A, is the back plate B, is the pad catch. C C C C, is the small frame or rather four square plates joined together at the ends, with an axis passing through the middle on which are three buttons D D D, which are operated by the key

Fig. 2.

inserted in the hole F, passing through a tube G. This small tube is fixed firmly to the side of the lock. Therefore the axis of the buttons and to which C are attached, is somewhat hollow and moves out and in the tube G, so when there is nothing to hold the frame C, with its catch in B, the spring E, throws out the catch and it is what it is called unlocked.

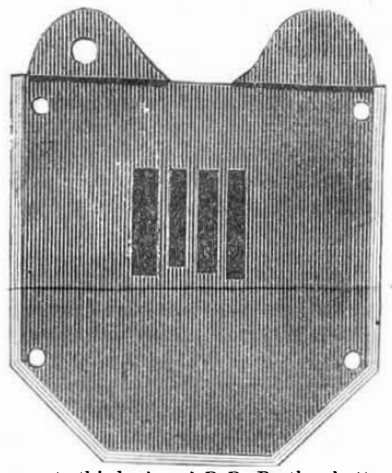
Munn & Co. are the Agents for the sale of rights, &c. Ths Scott medal was awarded by the Franklin Institute of Philadelphia, for this lock, and that is only awarded for rare and ingenious inventions, and there can be no doubt but it will soon come into general use.

Fig 3.



This will explain the operation of this lock still further. The same letters refer to like parts of fig 1. This view shows the circles of the buttons projecting above the parts C C C C, therefore it will be plain to every one that if the groom plate fig 4.

Fig4.

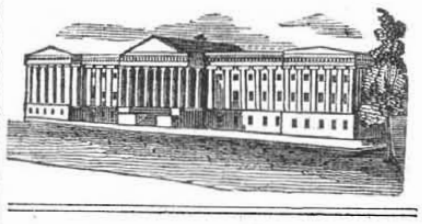


was on to this lock and D D D, the buttons caught into the grooves of this plate, that the spring E could not relieve the catch B from that of, C. This then is the principle of this lock, but let us state some of its advantages. Fig 2. shows all the parts of fig. 1, with H the axis thrust through G.

Figure 5.

This engraving shows the principle of this lock applied to any one of the common kind to render it burglar proof. A, is a small lock of this kind screwed on the plate of a common lock just behind the main bolt B. A has a small opening in the side to receive B, therefore when B is thrown out at the other end, if C (as shown in fig. 4,) be thrown behind B, and not retained there by the same principle described already, that it will be impossible to thrust back B, until it is relieved by opening A. Thus a common lock, for a very trifling expense can be made as safe as some that cost $60. The several parts here displayed are those of locks quite common and need not be further described than to say that C, is the axle to throw out the main bolt B. E E, is a cross piece of metal connecting two minor bolts B B. D, is a catch to hold back the minor bolts when required.

The advantages of this lock are simplicity and yet intricacy, especially as will baffle any person to take an impression of the key by wax or any such material. This is owing to the buttons being operated by the key either singly or collectively, so that one button in a groove of fig. 4, will hold the door perfectly locked—therefore when the catches are entwined the key can be turned backwards and one button only with its circular part left to project into the grooved plate. This key can only be turned one way or else the lock never can be opened. This can be best explained by the model which is at this office.



LIST OF PATENTS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending Oct. 10, 1848.

To Augustus Hamann, of Washington, D. C., for improvement in Spark Arresters. Patented Oct. 10, 1848.

To T. M. Hemphill and R. H. Knox, of Washington, Ohio, for improvement in Mills for Grinding. Patented Oct. 10, 1848.

To B. F. Berwick, of New York City, for improved Screw Blank Machine. Patented Oct. 10, 1846.

To Oscar S. Burgess, of Columbus, Ohio, for improvement in Harness Buckles. Patented Oct. 10, 1848.

To John P. Hayes, of Boston, Mass., for improvement in Chimney Caps. Patented Oct. 10, 1848.

To David Dick, of Meadville, Pa., for improvement in Presses. Patented Oct. 10, 1848.

To Livingston, Roggin & Adams, of Pittsburg, Pa., for improved Moulder's Flask. Patented Oct. 10, 1848.

To Frederick Emerson, of Boston, Mass., for improvement in Ventillating Ships. Patented Oct. 10, 1848.

To James H. Sweet, of Concord, N. H., for machine for making Spikes. Patented Oct. 10, 1848.

To Joseph Schofield, of Philadelphia, Pa., for improvement in Uterine Supporters. Patented Oct. 10, 1848.

To Samuel J. Seeley, of New York City, for for improved Shot Plug. Patented Oct. 10, 1848.

To H. W. Day, of Boston, Mass., for improvement in Type Moulds. Patented Oct. 10, 1848.

To Jacob Shaw, jr. of Hinckley, Ohio, for for improvement in Wheels for Spinning. Patented Oct. 10, 1848.

To Charles Sines, of Village Green, Pa., for improvement in Corn Shellers. Patented Oct. 10, 1848.

To William Wright, of Philadelphia, Pa., for improvement in Blocking Hats. Patented Oct. 10, 1848.

To Lewis Roper, of Philadelphia, Pa., for improvement in apparatus for administering Ether. Patented Oct. 10, 1848.

RE-ISSUE.

To Tim. D. Jackson, of New York City, for a Bell Telegraph. Re-issued Oct. 10, 1848.

INVENTOR'S CLAIMS.

Planing Rived Staves.

To Hervey Law, of Wilmington, N. C. for improvement in machinery for planing rived staves. Patented Sept. 19, 1848. Claims in combination with the cutter, rest, and follower, or any well known mechanical equivalent thereof, the separate supporting levers acted on by weights, one lever acting on each edge of the stave to produce separate and independant pressures near the two edges, holding it firmly against a single fixed piece or rest immediately opposite to the cutters, but permitting all other parts of the stave however crooked, twisted or variable in thickness to pass free from constraint and at full liberty to take whatever movements lateral and vertical its crooks and windings may require, whereby the dressing is allowed to follow the bendings and windings of the stave without cutting against the grain of the timber and in combination with the parts above claimed. Also the segmental hold fasts acting to draw the stave from between the cutter wheel and roller and thereby prevent the irregular thinning away of its extremities.

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NEW YORK, OCTOBER 21, 1848.

The Great Fair.

There is an additional temporary building fitted up this year for the operations of machinery, consequently the machinery is better displayed this than during any previous Fair. The room, however, is too small, it is perfectly jammed. Were the whole Hall a machine room it could be filled up easily. From what we have seen of this Fair, we are convinced that an exhibition Hall for machinery —a Museum—might profitably, both for owners of machines and the Institute, or some other Association, be kept open throughout the whole year in this great city. Then would come here the inventor with his new machine, and here would resort the manufacturer to behold the latest improvements. In a great measure, this has almost become a fixed habit at any rate, but what we want is a focus—a continual centre of exhibition.

Any Association that would manage an affair of this kind well, would do the country some service. The Institute, we have been informed, is going to do the genteel thing this year, in the distribution of prizes and all things connected with the Fair. This is necessary, for there is not quite such a variety of articles exhibited this year as there were in 1847. Eighteen out of the twenty-five of last year's managers are also managers this year.

The collecting and exhibiting the fruits of American industry by Fairs, is both wise and laudable. Such exhibitions lead to emulation, improvement and advancement in the useful arts—upon which depend the prosperity of our country.

Associations of Capital and Labor.

We are right glad to see practical men uniting their capital and labor together in mutual associations. No other way appears to be so reasonable as this for the elevation of our mechanical classes. The general way in which manufacturing operations are conducted is for one, or a few men of great wealth, to unite together (often without the knowledge to construct a single article of manufacture) and hire practical men at so much per day or week, the capitalists reaping the greatest share of the benefits. We do not mean to say a word against men of capital doing this—every man has a right in this country to invest his money when, and how he pleases—capital has its rights. But why should not workmen enjoy both the fruits of their toil and the benefits of capital also. We have known a number of such associations that were perfectly successful, and they all might be, if care was taken that kindred spirits alone formed the association. When capital and labor are united, a direct advantage over mere capital is apparent, and this is right. It is too bad, to behold mechanics—industrious and sober men who have served a good apprenticeship—*condemned* for the want of a little capital to labor hard as journeymen when their heads are covered with the frosts of many winters. The only way for mechanics to rise above this evil is to associate their capital and labor together. The amount each may possess may be small, but ten with $300 each make a joint capital of $3000, and every day's labor is so much capital added to the stock.

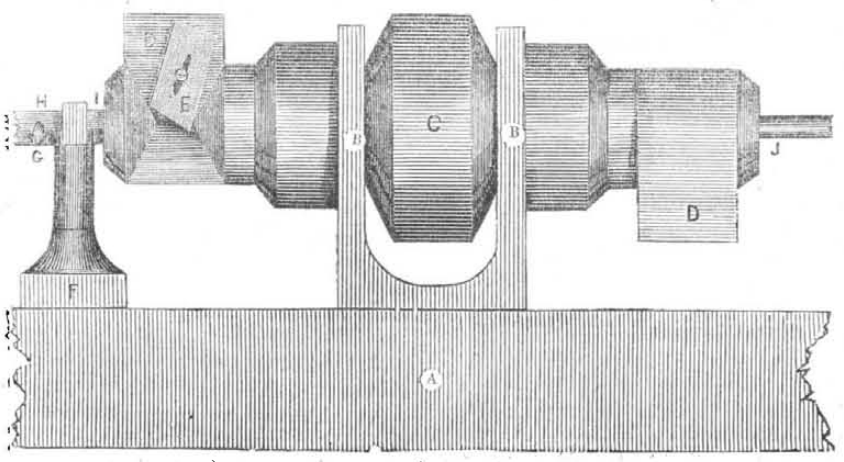
To be successful, the company must be composed of sensible, honest and industrious men—each looking to his neighbor's rights as well as his own. We believe that no country on the face of the globe offers so many advantages to our mechanical and operative classes, as the United States of America. Our political organization in reference to social elevation, is only of a negative nature—it is to prevent evils and is the very best for that purpose, but the happiness, comfort and advancement in civilization of our people, rests on the foundation of *moral worth and intelligence.* It is therefore our opinion, that to elevate our mechanical classes, there is not an absolute necessity of exploring a new territory and removing to new fields. The materials for elevation are at command and the tools are in our mechanies hands, while the field of operation is at their own doors, and we are glad to know that many of our mechanics have sense enough to perceive this.

We have been led to make these remarks, by having been informed, that a number of our practical pianoforte makers—men whom we know to be of sterling stuff, have associated their capital and labor together and formed the North American Piano Forte Manufacturing Company. The manufactory is at No. 88 Walker st. near Broadway, and from the qualifications of the members of the company the best and most improved piano fortes will be made by them. This is to be expected for every one has an interest in the business and no doubt (it is reasonable to expect it) their work and fame will soon be wide spread. Our wealthy classes, yea all our people wish success to such enterprises—it is part of the American character, to rejoice in the prosperity of industrious and enterprising men.

Liberia Coffee.

Coffee from the Colony of Liberia has been received in Boston, and proves, on trial, to have a very fine flavor. Some good judges have pronounced it equal, if not superior, to the finest Mocha. It is a very highly flavored, and a smaller quantity is required to make a beverage of good strength than is necessary with coffee of some other kinds. The specimen imported came from the farm of the Rev. M. More, in Bassa country. The coffee plantations in that country are beginning to afford a surplus for exportation. The Hon. S. A. Benson, of Bassa Cove, sent over by the Liberia Packet, a few weeks since, about fourteen hundred weight. If it finds favor in our market the cultivation will rapidly increase. The taste for good coffee seems now pretty firmly established, and every body, who has not forgotten it, laughs at Madame Sevigne's old prophecy that the taste for coffee and the poet Racine would pass away together. Deeply as the French poet is reverenced by his countrymen, even they love coffee perhaps as strongly, and in countries Racine never thought of, a good cup of Mocha Liberia is a highly prized luxury.

PICKET MACHINE.



This is one of those labor saving contrivances which from its simplicity costs but little, though the advantages derived from its use are certainly great. How much is added to the beauty and cheerful aspect of a country house, by the erection around the premises of neatly turned picket fences, those of our readers who reside in the country will at once appreciate. But in most villages there are few who thus adorn their dwellings, on account of the expense, as by the old way each particular picket must be turned out in a lathe by hand, an operation which consumes much time and labor. To remedy this and to bring within the reach of every person one of the best means of beautifying their homes is the design of the Picket Machine, of which the above cut is a representation.

The machine is chiefly composed of one iron casting of the above form, having a round passage extending through its whole length; cutters are attached at each end. A is a stout frame upon which the whole is placed. B B, are supports upon which in brass Journals the machine revolves. C is the pulley by which motion is communicated. The sticks of which the pickets are formed do not revolve, but are held in one position by means of a square notch near H in the bearer F, but the machine on which the cutters are fastened, revolves with great rapidity. E shows one of the cutters, fastened by a screw upon the projection D. A cutter is fastened in the same manner at each end of the machine, though only one is seen in the engraving, as the other end shows the back of the projection D. The ends it will be perceived are of peculiar formation having apertures just at the edge of the cutters in order to allow them to meet the wood as it passes through. The rough stick being introduced at I comes in contact with the cutter E and passing through to the other end meets another cutter which gives it the finishing touch, and the picket comes out at J beautifully and evenly turned.

The great utility and cheapness of these machines must be apparent to every one. In country saw mills, grist mills, turning shops or wherever a little power is convenient they can be used to great advantage. Two boys with one of them can turn out two or three hundred pickets per hour.

We have now on hand one of these machines fitted to turn two different sizes of pickets, which we will dispose of to the first customer for $35. At one half the common prices for pickets the machine will pay for itself in *one day.* We can send it with perfect safety to any part of the United States. Any person wishing it will please remit the amount by mail and the machine shall be promptly forwarded.

Changes produced by Railroads.

The full influence which the passenger and traffic railway is to exert on the relations of society is far from being developed, but it is already great. Its agency is already felt in every department of public and private business. Its speed and punctuality are changing the habits of domestic life, the arrangements of commerce both in detail and in the gross, and even the civil and military organisation of states.

"Whoever has stood on an eminence that commands an extensive view of any of our main trunk lines, with its subsidiary branches, in the vicinity of some great centre of industry, must have been struck with its power of annihilating distance. At brief stated intervals the graceful white steam cloud, waving on the wind like some chivalrous banner, marks the progress of the train along the central line, while similar streamers, converging to it on every side, mark the approach of its tributary tenders. It is this organised system of intercourse that enables men in every department of commerce and public service to command for themselves and families the healthiness and amenity of a rural life while engaged in those pursuits which can only be successfully followed amid the close, dim, and jostling thoroughfares of a city. Even the poor labourer participates in the benefits conferred by this new agent of inter-communication by the extension of the sphere within which he can make his toil available."

Whoever has occasion to frequent the resorts of business must have noted the insensible change which the railways are producing in its arrangements. To take the first illustration which presents itself, we may refer to our country merchants who used to lay in goods at considerable intervals, and on a comparatively large scale. Now scarcely any of them keep large stocks on hand; by the aid of the railway they receive supplies they immediately want at intervals throughout the year. They are thus less subject to speculative uncertainties of price, less exposed to loss by injuries of accident to their stock, and more able to conduct their business on a safe ready-money system. The change is great from the method of some ten years back. In every department of commerce changes more or less akin to this can be traced to the agency of the railroad.

Ballooning.

Of the practicability of this air flying, N. P. Rogers wrote in this wise :—

"This ærostation can never, probably, come to anything useful. We can't navigate, for the purpose of commerce, travel, or discovery, the 'brave o'erhanging firmament,' or explore, in the gas distended craft, the great orb of day, the waning moon, or those islands of light that spring at night from the boundless Pacific 'hung on high.' No rudder can be invented that shall steer the light airship thro' the billowy clouds. The compass will not traverse, to point to the celestial pole, and no anchor can fix its crooked fluke in the bottom of the Æronaut's ocean."

This view of ballooning has been truly verified in the case of Dr. Morrill, who last week made a journey from Niblo's Garden in this city and came near losing his life by dropping into the Atlantic instead of *terra firma.*

Female Medical Instruction.

We see by a paragraph in the Boston Mail, that a course of medical instruction for females is about to commence in that city. This is said to be the first time, in our country, that systematic instruction has been provided for females in this rich branch of practice. It is stated that there is in all directions, an urgent demand for qualified Midwives. In a number of places, money has been raised and committees appointed to select suitable females to receive instruction in this course.—Quite a number of pupils are already engaged.

We would be more obliged to our worthy contemporary, the Farmer and Mechanic, if it would give us credit for our original articles, instead of giving it to imaginary papers, as it did with the "Improvement in Printing Yarns." There is nothing more disrespectful to a co-laborer in the same field, than an act of this kind—rather give no credit at all. It is like borrowing a tea kettle from Mrs. Jones and taking it home to Mrs. James, with many obligations for her favors. We are not indebted to our friend for such favors, but others are at our expense, as the last week's Farmer and Mechanic can abundantly testify.

Suspension in the Coal Trade.

In consequence of the reduced consumption of coal this year, from the general suspension of iron foundries in Pennsylvania and other states, the Lehigh Coal and Navigation Company find themselves unable to dispose of their stock, except at prices which will not pay expenses. They have accordingly suspended their shipments from Mauch Chunk. Much distress among the operatives in the mining regions will necessarily follow this suspension.

A splendid steamer, called the Hiram Powers, in honor of Ohio's celebrated artist, has been built at Cincinnati.

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For the Scientific American.

Patent Laws.—Selling before the Issue of a Patent.

No 3.

It may be said, and many no doubt suppose, that the 7th section of the Act of 1839 must be understood to apply to sales only during "the time intervening between such sale and the application for a patent, and cannot mean to allow sales of the same articles after that time." The language, however, is perfectly clear and explicit, that every sale or construction of a newly invented article made prior to the application for a patent, vests a "right" in the purchaser or manufacturer to "use and vend to others to be used," the "specific" articles so purchased or constructed, "without liability therefor" to any person whatever. It does not indeed in words, say that such right may be exercised after the patent issues; but, unless such were the effect intended and naturally resulting, the provision would be absurd, for if one possesses a "right" he cannot be divested thereof in law, except by his own act, and as the statute authorises him "to use and vend," this privilege is unlimited, for the inventor or patentee has no privilege of monopoly not expressly confined by statute or necessarily resulting from and belonging to the privileges given him; and in thus using and vending such persons are particularly exempted from all "liability to any person whatever, at any time, as is shown by the use of the comprehensive and universal expression "without *any* liability." Thus if the inventor allow B. to construct a quantity of his machines prior to applying for a patent, which machines remain in B.'s hands after the patent issues, B. can sell them and the purchasers may use them without infringing the patent.

As to sales of *territorial rights* before a patent is obtained, nothing is said in the statutes; the subject must therefore be governed by such other principles of law as will apply. Since it is uncertain whether the inventor will succeed in obtaining a patent until he actually receives it—long delay and careful examination being had at the Patent Office by the proper officers—it is plain that he cannot sell a "patent right," for he possesses none. He can, however, make a contract (if a person can be found sufficiently devoid of common shrewdness to make such a purchase) that he will assign a territorial right in case he obtains a patent, and may include a stipulation in regard to intermediate manufacturing, using or vending. Such a contract would be good in law, and similar agreements are of daily occurrence. As such a contract is "executory," to be valid only in case the patent is obtained, there would be considerable risk to both parties in making it, for the issuing of the patent is in reality but an uncertain contingency.

The safe course to be adopted, if inventors make sales before applying for patents, is, to require written agreements from all purchasers that they will *use* the invented article only and return it to the patentee when a patent is issued; and if they permit others to manufacture, to require a stipulation from them that all machines they may have on hand or unfinished, at that time, shall on just terms become the property of the patentee, the manufacturer to agree also that every person to whom he sells shall be restricted to *the use only* of his purchase, and by no means to construct another after the same manner.

I will observe in conclusion that it is not necessary and scarcely expedient that an inventor should scatter his contrivances over the country before applying for a patent, whether for the purpose of advice, commendation and popularity, or to raise money. If he knows in the outset *what* he wants to invent, he can tell for himself whether it be worth attempting; and after a little progress he can, if possessed of an intelligent acquaintance with the scientific principles applying, form a sufficient opinion of its utility. Then after making a working model for private use and experiment he can himself ascertain and correct all deficiencies. After doing this he can apply for a patent, and no other person will be acquainted with his secret. If, however, he must have the advice and suggestions of competent judges, they may be had without giving or selling to such persons a single specimen of the invention. If the inventor be poor, then he should borrow money to secure his patent, or failing in that let him labor with increased energy until the necessary sum has been earned; he will be much wiser by being patient and persevering, and in the end much richer than if he had made sales indiscriminately or taken a partner.

If any are desirous to obtain the laws, forms and instructions of the Patent Office, they can be had without expense by writing to their representatives in Congress. It has occurred to me, however, that a compilation of the patent laws and judicial decisions (American,) with a concise elementary exposition of the whole patent law, and full directions and forms of procedure, accompanied by a complete general index, presented in a cheap and comprehensive form (pamphlet) would be of great benefit to a large class of enquirers whose numbers are constantly increasing, at the same time that it would supply a deficiency nowhere at present filled, being in character and arrangement entirely different from any other work on patents. If this impression is correct, and sufficient desire for such a work should be manifested, I will engage to prepare it.

W. F. Liddell.

Rochester, N. Y.

For the Scientific American.

Turning of Irregular Forms.

Prior to the invention of Thomas Blanchard (as he mentions in his specification) there was a machine in Waterbury, Conn, for turning lasts,—the invention of Azariah Woolworth now of Hartford, Conn. who, like most original inventors, was by reason of limited circumstances prevented from securing himself or invention against piracy and was therefore compelled to convey it to an Assignee for the purpose of obtaining letters patent, which assignee brought a suit against said Blanchard for the infringement of said patent when he, (Blanchard) compromised the suit and purchased the right of said patent, and conveyed it to the Blanchard Gun Stock Company; and for the space of 14 years had control of said Woolworth's patent;—and said Blanchard not asking a renewal of said conveyed right, it has become common property and the public have a right to use the same. But Blanchard contending that Congress had renewed to him his invention (which if he ever had a legal one, except that conveyed to him by said Assignee) is a question to be settled hereafter. For nearly the space of 14 years the original invention was locked up in the Blanchard Gun Stock Company and all right of the inventor lost.

Mr. Blanchard has made Congress as well as the public believe that it was his own invention; and under the renewal granted him presumes to have the power to prevent any person, except those having license from him to make lasts or spokes by any machine whatever; although in the case which was tried last Spring, Blanchard against myself and others, in which the jury were unable to agree, the judge charged the jury that although the defendants' machine was superior to Blanchard's it contained his combination, for it was not in evidence that said combination was in use before his alleged invention. And when the evidence was produced to prove that such combination did exist, it was objected to, on the ground that legal notice of its production had not been given. Yours, &c.

Philadelphia. J. B. Eldridge

Adulteration of Bread.

In England when alum is cheap and flour dear, it is a common thing to adulterate the flour with this stuff, and so inveterate is the evil, that many have supposed it morally impossible to iradicate it. The custom is so universal that the most respectable baking establishments are stained with the crime, for we can call it nothing else. Alum to be sure, is not a deadly poison but it contains no nutriment, and is so far a fraud upon the purchaser. But it has also a very decided effect upon animal matter either dead or living; it dries, contracts, and hardens. Of course when continually taken in food it gradually acts upon the bowels; by hardening them, it hinders the proper performance of their function and constipation is the result. To counteract this, purgative medicines are given, but as the cause of the evil still continues these can afford merely a temporary relief. These are mainly called into existence by the alum bread, and thus the consumer is first robbed by the baker of his money and his health, and then again fleeced by the quack.

The poor people are the greatest sufferers, and this is a great shame, for as they raise the beef and bread, they certainly have the best title to use them.

To detect the presence of alum in bread—the bread must be soaked in water, and to the water in which it has been soaked, a little of any test for sulphuric acid must be added. (Solution of muriate of lime will do.) Upon which, if any alum be present, the liquid will be pervaded with milkiness; but if the bread be pure, the liquid will remain limpid. Rationale.—Sulphuric acid has a stronger affinity for lime than for the alumina and potass with which it forms alum; it, therefore, quits those bodies, to form sulphate of lime with the lime of the test which produces the milkiness.

Charcoal.

Charcoal is usually made by piling wood, covering it over with a compact earthy layer and firing it, when the slow combustion of a portion of the volatile combustibles and of the wood itself expels the residue of the volatile matter. Such heaps are termed charcoal pits. The following is an outline of the process. Logs not more than 6 feet long and 6 inches thick are laid either horizontally or vertically and stems and branches are employed to fill up the interstices. The whole is covered with from 3 to 5 inches of earth, or still better with a mixture of earth and fine charcoal over a layer of leaves and small brushwood, and kept moistened with water. The heap is ignited by coals thrown into the chimney in the centre when the fire "draws to the sides" towards small openings left around the base. A heavy, yellowish-gray smoke and much watery vapor first appears, which condenses on the outer covering called sweating. The fire should be rapid during sweating, to avoid explosions, and the heap carefully sweated off, requiring 16 hours from the beginning.—The general shrinkage of the wood opens cracks, when the coalman mounts the heap, rams the wood together, and replaces the covering. When the heap is fairly warmed, and no farther explosions to be feared, the openings are closed, and the heap suffered to burn several days. A few openings are now and then made for the escape of the tarry matter, &c., and a few others at the foot: and after 4—8 days others half-way up the heap to char the outside logs. If a blue flame rises, the openings are stopped and made lower down. When the fire gradually breaks out uniformly around the base, the charring is complete. The heap has become smaller and very irregular in form from shrinking, &c. The whole time required is from 6 days to 5 weeks, according to the size. A heap of 3000 cubic feet requires about 15 days.

Economy is an important point in charring, for the object is to employ as little of the charcoal as possible for expelling the volatile matter, and no doubt the combustion of some of the volatile matter assists in it. There is a great difference in the amount obtained by slow and rapid charring, in favor of the slow process. To insure slow charring, little space should be left in the pile, and the interstices should be filled with fine coal, or *culm*, of a previous burning. This was tried and found to give 10 per cent more in bulk, and the charcoal was 20 per cent heavier, and well charred.

The ashes of charcoal is less in quantity than that of the wood from which it is produced, a portion passing off even by a very slow distillation. The alkaline matter especially diminishes, being probably carried over in combination with acetic acid.

Charcoal is chiefly employed as a fuel, igniting readily, burning freely, with a strong heat, making a clean fire, from the absence of volatile and other matters. It is farther used in the manufacture of gunpowder and fireworks; as a decolorizer, disinfector, and antiseptic. From its imperfect conduction of heat, it is often used as a casing for heated pipes; and from the same property and its reducing quality it is useful in Blowpipe experiments. It is an important reducing agent employed in the arts and in this respect is decidedly superior to any other, where the quality of the metal, &c. is important.

Influence of Sounds on the Elephant and Lion.

In the human ear the fibres of the circular tympanum radiate from its centre to its circumference, and are of equal length; but Sir E. Home has found, that in the elephant, where the tympanum is oval, they are of different lengths, like the radii from the focus of an ellipse. He considers that the human ear is adapted for musical sounds by the equality of the radii, and he is of opinion that the long fibres in the tympanum of the elephant enable it to hear very minute sounds, which it is known to do. A pianoforte having been once sent on purpose to Exeter Change, the higher notes hardly attracted the elephant's notice, but the low ones roused his attention. The effect of the higher notes of the piano-forte upon the great lion at Exeter Change was only to excite his attention, which was very great. He remained silent and motionless. But no sooner were the flat notes sounded, than he sprang, up, attempted to break loose, lashed his tail, and seemed so furious and enraged as to frighten the female spectators. This was attended with the deepest yells, which ceased with the music. Sir E. Home has found this inequality of the fibres in neat-cattle, the horse, deer, the hare, and the cat.

Singular Insanity in Paris.

It could not have been expected that three revolts in Paris, fighting in the street, 300,000 men engaged, and dreadful slaughter should have taken place without creating wildness and insanity among many classes to a great extent. As soon as the revolution broke out in February, the hospitals began to fill. Dr. Borsmont states that the first patients were generally sad, melancholy, and despondent. Their fancies were of a heart-rending description, as they expressed a constant fear of being slaughtered and assassinated. The patients of this class mostly belonged to the respectable trading part of the community, and many of them had, by industry and preseverance, succeeded in amassing some property. In order to escape the misfortunes they dreaded; some of these patients tried to destroy themselves, and the most careful watching was necessary to prevent them from doing so. Two starved themselves to death in spite of every precaution. A short time afterwards, another description of patients were received, whose derangement might be fully attributed to the working of the new political ideas. These were not dejected and sad; on the contrary, they had proud, gay, and enthusiastic looks, and were very loquacious. They were constantly writing memorials, constitutions, &c., proclaiming themselves great men, the deliverers of the country, and took the rank of generals and members of the government. The last revolution greatly increased the number of insane patients, who talked of death, guilotine, ruin, pillage and fire.

Something for All.

So various are the appetites of animals that there is scarcely any plant which is not chosen by some and left untouched by others.—The horse gives up the water-hemlock to the goat; the cow gives up the long-leaved water-hemlock to the sheep; the goat gives up the monk's head to the horse, etc.; for that which certain animals grow fat upon others abhor as *poison*. Hence no plant is absolutely poisonous, but only respectively. Thus the spurge, that is noxious to man, is wholesome nourishment to the caterpillar.—That animals may not destroy themselves for want of knowing this law, each of them is guarded by such a delicacy of taste and smell that they can easily distinguish what is pernicious from what is wholesome; and when it happens that different animals live on the same plants, still one kind always leaves something for the other, as the mouths of all are not equally adapted to lay hold of the grass—by which means there is sufficient food for all.

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TO CORRESPONDENTS.

"S. D. B. of N. Y."—Your letter came too late to be answered last week. You cannot obtain a patent for a new application of an old principle. You could for a new combination of machinery by which you used the old principle. $1, O. K.

"W. T. M. of Chesterfield."—You will receive an answer by mail soon.

"H. L. of Md."—We can't find out. You can learn who holds the rights by dropping a line to Rochester.

"O. L. R. of N. H."—We do not know of any machine such as you describe. We think no notice of such a machine has appeared in our columns.

"N. G. Jr."—Your combination is a little different but of no practical benefit. We do not think it worth patenting.

"J. F. M. of Pa."—Polish your glass with Tripoli. It will take a long rubbing, as the scratches have literally to be ground out.

"T. A. D. of Ind."—There is no doubt but your plan would operate, though the power produced from the wheel would probably be so small as to be of no service. No practical benefit can result from it.

"A. M. W. of Mass."—You are welcome to the papers, which is herewith sent. Hope you will induce some of your friends to subscribe. We should be glad to receive your plan of a rotary engine.

"B B. of Me."—We are very much obliged for the list of subscribers you have sent. You have our sincere thanks for your exertions. We are glad to know that the engraving pleased you. Mr. A. will see an engraving of a planing machine and description in this paper soon. If he or any one in your part of the country wants one please send them to us. Please say to Mr. S. that the best work on Naval Architecture costs $35. There is also a good work costing $4. We can send either of the above if he will enclose the amount to us.

"W. P. E. of Ct."—We do not understand your plan.

"E. M. of Mass."—No one but the *original inventor*, can obtain a patent for an invention, whether foreign or American. If you make an improvement on a foreign invention, you can obtain a patent for the improvement only. In England any one can obtain a patent for an invention. But in this country the inventor only, receives a patent.

Patent Office Business.

Some of our friends who were promised that their specifications and drawings should be finished and forwarded this week will have to excuse us till the next. We are very sorry that we are not able to fulfil every promise made to them but the illness of our principal Draftsman and a multiplicity of business connected with the "Great Fair" has prevented our usual promptness. They shall receive proper attention next week, however, and we hope never to be obliged to disappoint again or to ask forbearance for not fulfilling our promises.

Reply to J. K. Eldridge.

Mr. A. R. Carter, agent for Blanchard's machine for turning irregular shapes, requests us to say that he shall furnish an article in reply to the one over the signature of J. B. Eldridge as soon as his infringement cases are decided upon, at Philadelphia, and that he will also give many statistics relative to the validity of their claim and the important decisions made in their favor.

Lead Pipes and Water.

Dr. James R. Chilton of this city, says that he tried experiments with Croton water on lead pipes, composition pipes, and lead pipes coated with pure tin after the plan of Mr. Ewbank. The pipes were forty feet in length and were filled with water brought in a cask from the Croton River. The water was displaced from the pipes by admitting fresh supply at intervals of a day or two, for three weeks; and that which escaped was tested each time. The result proved that the water which passed through the lead pipe always contained lead, while that from the pipe made of the alloy of tin and lead, as also that from the pipe coated with tin, both upon the inside and outside, did not contain a particle of lead, but for the first few days yielded a trace of tin.

It is possible that the water, in passing rapidly through a lead pipe of moderate length, in constant use, may not become so impregnated with lead as to be injurious to health. But there are hundreds of instances where the pipes are conveyed to the second and third stories of houses, where the water is seldom used, but from which the servant may find it convenient to fill a pitcher. The internal use of the water from such situations, is highly injurious, and manifests itself by tremulousness and generally debility of the nervous system.

Increase of American Exports.

A Parliamentary report of exports from the United States to Great Britain for five years, from 1843 to 1847, shows an aggregate increase since 1843, of more than *one hundred and fifty per cent.* Among the articles enumerated are oil, staves, naval stores, beef, tallow, hides, pork, bacon, lard, cheese, wheat, corn, flour, corn meal, rice, wool and hops. The increase of bacon, lard and cheese is equal to *one hundred per cent.*, of corn more than fifteen million per cent, there having been none exported in 1843, and 15,526,525 bushels in 1847. Thus is the United States pouring her rich harvests into the old world.

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New Haven, July 17, 1748. jy29 3m*

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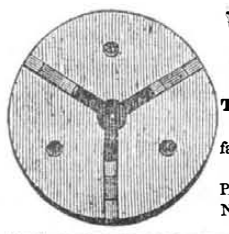

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For the Scientific American.

New Chemical Law.

No. 5.

This chemical law also applies to the compounds of an aggregated series with other substances, full as well as to the aggregated series alone, as may be seen by inspecting the properties of the following compounds. According to the condition required by the law, each substance comprised in an aggregated series must unite with an equal number of atoms of oxygen, to form an acid; and this it may be seen is the case with the aggregated series last given. All equi-carbohydrogens, in uniting with oxygen to form a definite acid, unite with precisely four atoms.

The following example shows a series of acids, formed by the union of oxygen with each substance comprised in the aggregate last given; and also acids which are compounds of equi-carbohydrogens, not given in the previous example because not recorded. There is no doubt, however, that if their acids were distilled in contact with lime, a carbohydrogen might be produced, the same as is the case with the generality of acids.

	S. Gr.	B.	Pt.	
Formic Acid 2 C H.+O4.	1,235	212°		fluid.
Acetic Acid 4 C H.+O4.	1,063	240°		fluid.
Butyric Acid 8 C H.+O4.	,976	318°		fluid.
Valerianic Acid 10 C H+O4.	,944	347°		fluid.
Cocinic Acid 17 C H.+O4.				solid.
Myristic Acid 28 C H.+O4.				solid.
Palmetic Acid 32 C H.+O4.				solid.
Margaric Acid 34 C H.+O4.				solid.

Here is a case which, as far as it goes, is complete in every particular. It may be recollected, that in speaking of the properties of the compounds of an aggregated series, it was mentioned that their specific gravities might increase or decrease, according to the nature and specific gravity of the substance uniting. In this case it may be seen that the specific gravities decrease, as the series increase in a regular manner. The specific gravities of the four remaining substances should be less than the four whose specific gravities are given. The boiling points also increase with the series in a regular manner, and therefore by the law, the boiling points of the four remaining substances should also be on the increase, and greater than those of the first four whose boiling points are given. It may also be noticed that there is a gradual increase of density. Thus Formic acid the first substance in the series, is a fluid, but as the series increase, the substances produced exhibit the properties of a solid. Thus while the first four substances are fluids, the remaining four are solids, which is in conformity with the conditions required by the law. The chemical properties of those substances situated nearest to each other are strikingly similar, which also agrees perfectly with the conditions required; thus it is well known that the Formic and Acetic acids closely resemble each other; and although the chemical properties of the substances composing the series, gradually differ as the series increase, yet when any two are taken, closely situated to each other by their composition, it will be found that they possess similar chemical properties. This similarity of chemical properties is highly characteristic of either an aggregated series or its compounds, although it gradually differs as the series increase.

The following is an example of the compounds of the foregoing aggregated series, with one atom of water, and are generally known as Ethers. All of the substances comprised in that series do not unite with water, at least they have not been discovered. The reason that they do not all unite with water, may be attributed to the 11th article or condition of the properties of an aggregated series, which says that all those substances situated the highest in the list, generally have the least affinity for any particular substance, consequently those situated the lowest in the list have a greater affinity for water than those above them. If any Ethers of the higher aggregated compounds are in future discovered, they can be easily classified.

	S. Gr.	B	Pt.
Oxide of Methyle 2 C H.+HO.			gas.
Oxide of Ethyle 4 C H.+HO.	,725	76°	fluid.
Oxide of Amyle, 10 C A+H O. (unknown to exist.)			

In this instance it may be seen that the boiling points also increase with the series, as the first substance being a gas at common temperatures, must already be considered by the laws of chemistry as in a boiling condition.—Now the second substance boils at 76° and there shows that the boiling points increase with the series. We can tell nothing by the specific gravity, as only the specific gravity of Oxide of Ethyle is given. The property of the density increasing with the series is perfect, as may be seen upon examination.

S. N.

Bridgeport, Conn.

History of the Rotary Engine.

Prepared expressly for the Scientific American.

BRAMAH'S ROTARY ENGINE.

This is one of the inventive Bramah's rotary engines, he having obtained three patents in 1790. The patent was taken out jointly with Mr. Thomas Dickinson.

Fig. 9.

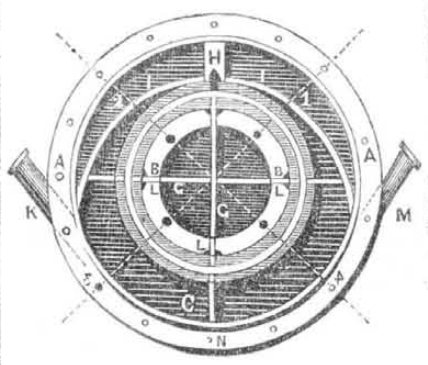
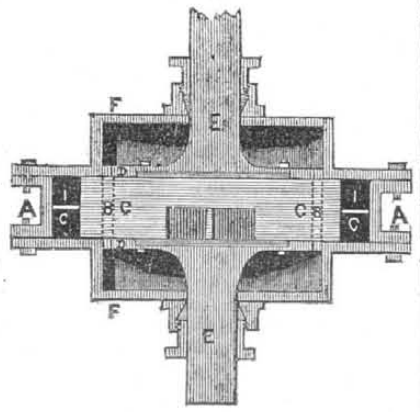


Fig. 9 represents the plan of one of these engines, and fig. 10 a section. A A and B B, show the ends of two short cylinders or rings of different diameters, one placed in the centre of the other. C is the channel or circular groove, formed between the two circles. The ends of the cylinder or ring B B, are shut up by two flat plates D D, as shown in Fig. 10; to these plates is joined an axis or spindle E E, which axis or spindle passes through the ends or caps F F, which encloses the ends of the cylinder or ring A A, and which is made air-tight by means of a stuffing box in the usual way. By this axis or spindle the cylinder or ring B B, may be turned round from without, any external power being applied for that purpose; or this axis or spindle may be applied to give motion to any other machine, when the cylinder B B, is turned round by any power or force acting from within. In the cylinder or ring B B, are fixed two sliders, G G, crossing each other at right angles in the centre where they are notched or half spliced, so far as to allow them to slide backwards as much, at least, as the diameter of the channel or groove C. The length of each of these sliders is equal to the diameter of the cylinder or ring B B, and one diameter of the channel or groove C; so that the points which perforate the extremity of the cylinder or ring B B, when they are pushed out into the channel or groove, may entirely fill the same, similar to a piston working in a common cylinder; in order that, when the cylinder B B, is turned round, the channel or groove may be by that part of the slider totally swept or emptied. In this channel or groove is fixed the partition H, which fills the same in that part, and, by its being fitted against the periphery of the wheel B B, prevents the passage of any fluid that way round the channel, when the caps or ends are screwed down. On each side of the partition H, is fixed a rib I I, or piece of such a shape as to perfectly fit the circle B B, one quarter of its circumference, between the doted lines 1 2; and the remaining part is continued in a shape inclining to the circle of the greater cylinder A A, with which it forms an easy juncture at the quartile points, 3 4. When the cylinders B B, with the sliders, are turned round in either direction, the inclined parts of the ribs I I,

Fig. 10.



force the opposite end of the sliders G G, successively into their channel or groove, where they are obliged to remain during one quarter of the revolution, being kept in that position by the circular part of the rib between 1 and 2. K M, are two pipes of any required diameter, which may be inserted into the channel or groove, in any direction the situation of the machine may require, between the points H 3 and H 4. The sliders are rendered sufficiently tight at their junction with the channel, by means of oakum or any other flexible material, being forced into the cavities made for that purpose at the parts L L L; and also the partition H in the same way. The cylinder or ring B B, being thus armed with the sliders, and the caps or ends, F F, screwed on by the flanches at A A, the machine is complete and ready for action. Now, supposing that through the pipe K a jet of water, steam or any other fluid, from any considerable height is admitted into the channel or groove C, it would immediately force against the slider projected in the channel as at N, and also against the fixed partition H; which partition, preventing its passage that way to the evacuation pipe M, where the spent water is discharged, the next slider in succession has passed or covered the junction of the ascending pipe K, so that each successive slider receives the pressure before it is done acting on the former; by this means an uniform rotation is maintained in the cylinder B B, and its velocity will be equal to the descent of the water in the pipe K, and its force equal to the specific gravity of the same. Thus this machine may be worked by steam, condensed air, or wind, or any other elastic or gravitating fluid, for the purpose of working mills, or any other kind of machine or engine whatsoever, they being properly connected with the axis or spindle E E; and when any power is externally applied to the said axis, which may turn the machine in any direction, it becomes a complete pump; possessing all the properties of every other sort of hydraulic engine whatsoever, by applying the pipes K and M accordingly; and it has also much advantage over every other kind of pump, as the fluid pumped is kept in constant motion both in the suction and ascending pipes. This machine may be fixed either in a horizontal or vertical direction.

Fire Cements.

1. For furnaces, crucibles, &c.—Fire-clay and brickdust or, fire-clay and burned clay, (broken crucibles) kneaded well together with water, and spread in layers on joints, and thoroughly air dried resists heat without cracking. It may also be employed for coating glass retorts by spreading it as a stiff paste or thinning it with water and spreading with a brush. A little hair added to it, gives greater tenacity. 2. Clay and brickdust mixed with water and 1-10 part borax, gives a difficultly fusible cement; clay and red lead may be used. To make it less fusible, common clay and sand may be employed. 3. For iron vessels, &c. mix 50.—8 parts fine and pounded cast iron turnings with 2 parts powdered sal-ammoniac and 1 part flowers of sulphur into a paste with water and apply it immediately; it forms a chemical union, and hardens rapidly. According to some, the sulphur may be omitted. 4. Four parts iron filings or turnings and 3 parts of a mixture of common and burned clay are made into a paste with saltwater.

To Stew Pumpkins.

Cut a fine ripe pumpkin in half, and remove all the seeds and other contents of the centre. Slice it, and pare the slices. Put them into a pot with a very little water, and stew them slowly till soft enough all through to mash easily. Then put the stewed pumpkin into a sieve or cullender, and mash it smoothly with the back of a flat ladle, letting all the moisture drain out, and leaving the pumpkin dry as possible. Put it away to cool and it will be ready for mush, bread pudding, or any similar purpose. To be eaten with meat as a vegetable, season it with pepper, adding some fresh butter mashed among it and send it to the table warm.

Mock Cream.

Beat three eggs well: then add to them three heaping teaspoonfuls of fine flour; beat them well together; then stir them into a pint and a half of boiling milk; add to it a salt-spoonfull of salt and loaf sugar to taste; flavor with essence of lemon, stir it while boiling; when it is perfectly smooth it is done.

Line pie tartlet pans with rich puff paste, and bake them in a quick oven; when done, fill them with mock cream; strew powdered sugar over the brown; when a fine color, they are done. These will be found to be altogether superior to custard pies.

How to make Leeches Bite.

Dr. Rennes, of Bergerac, advises that the leeches should be put for an instant into weak wine-and-water, the better for being a little warm, just before applying them; no sooner are they laid on the part than even the most sluggish pierce the skin instantly; those even that had been for a short time before used, immediately attach themselves. In the Hotel Dieu, the practice is to wring a linen cloth out of undiluted wine, and wrap the leeches in it for a few moments, which is found to have the desired effect.

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